Mobile Monitoring and AIRNow-Tech During the 2008 Northern California Wildfires

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Outline

• Introduction
• Mobile monitor deployment
• AIRNow-Tech
• Use of data
• Particulate matter monitoring considerations
• Aftermath
How the season started

Much below average precipitation February through June 2008

Lightning strikes: more than 6,000 on June 20-21, 2008

Radar composite reflectivity at 21:25 on June 20, 2008, showing lightning and precipitation
Summary of fires

- 1 million+ acres burned
- 2,000+ individual fires burning at the same time
- 25,000+ firefighters
- Thousands of tons of PM$_{2.5}$ emitted each day
- Millions of people affected by smoke
- **Unhealthy** to Hazardous AQI levels observed (ozone and PM$_{2.5}$)

Source: www.sparetheair.com
Mobile Monitor Deployment (1 of 5)

Motivation

• Fires and widespread regional air quality impacts were expected to continue for weeks or months

• Supplement to existing air quality monitoring network needed to assess wildfire impacts

Smoke on July 11, 2008
Mobile Monitor Deployment (2 of 5)

Purpose

- Focus on areas of Northern California with sparse monitoring coverage
- Assess smoke impact
- Support fire management and incident command teams
- Provide resources for air quality agencies
Mobile Monitor Deployment (3 of 5)

Data Flow

- Mobile Monitors
- Observations
  - Satellite/Cell Phone
  - AIRNow Data Management Center
  - AIRNow Tech
  - Emergency Response Coordinators
- Data Providers
Mobile Monitor Deployment (4 of 5)

Real-time data stream to EPA AIRNow and AIRNow-Tech

Hourly PM$_{2.5}$ concentrations in µg/m$^3$

Early June 2008

Late July 2008
Mobile Monitor Deployment (5 of 5)
AIRNow-Tech (1 of 5)

AIRNowTech.org

- Decision Support System – management and analysis tool for the AIRNow Program
- GIS functions – HYSPLIT trajectory tool, satellite, and smoke products
- Data queries, personalized tools, preferences, and services
- Ability to view meteorological and air quality data

Hazard Mapping System smoke plumes with forward HYSPLIT trajectories
PM$_{2.5}$ concentrations in µg/m$^3$ in AIRNow-Tech’s Navigator
AIRNow-Tech (3 of 5)

Hourly PM$_{2.5}$ concentrations in µg/m$^3$

July 9, 2008, at 11 a.m. PST

= Mobile Monitors

Hourly PM$_{2.5}$ concentrations in µg/m$^3$
Backward trajectory showing where Sacramento’s air came from during the last 24 hours.
Forward trajectory showing where the smoke from the wildfires was going during the next 24 hours.

24-hour forward trajectory at 300 m

July 10, 2008, at 11 a.m. PST
Hourly PM$_{2.5}$ concentrations in µg/m$^3$
Use of Data (1 of 2)

- USFS Emergency Smoke Response Systems
- Smoke impact forecasting – daily map and forecast discussions
- Outreach – air quality advisories
- Press releases
California Air Resources Board used graphic in news release on August 18, 2008 (http://www.arb.ca.gov/newsrel/nr062308b.htm).
Particulate Matter Monitoring Considerations During Emergency Response

- Monitoring in populated areas
  - Representative of local population
    - Senior centers, schools and day care centers, evacuation centers, town center, residential areas, incident command units
  - Diurnal winds patterns
- Operational considerations
  - Power, security, troubleshooting (all systems), periodic maintenance
- Maintain reserve
  - Back-up, unexpected questions
- Layered approach
Aftermath

- California Air Response Planning Alliance Summit – outreach and emergency response personnel to discuss air quality issues during air emergencies
- Increased participation of Northern California air quality agencies in AIRNow
- Fire Impact Potential analysis
- Fire almanac in production as a reference for next fire season
Questions?

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